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| 09/886,824 | 06/21/2001 | George Alfred Velius | 41942-52970 | 6850 |
| 21888 7590 10/03/2007 THOMPSON COBURN, LLP ONE US BANK PLAZA SUITE 3500 ST LOUIS, MO 63101 | | | EXAMINER BROWN JR, NATHAN H | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/886,824

Applicant(s)

VELIUS, GEORGE ALFRED

Examiner

Nathan H. Brown, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE (3) MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23, 25-31, 33, 35-44, 46 and 52-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23, 25-31, 33, 35-44, 46, 52-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Examiner's Detailed Office Action

1. This Office Action is responsive to the communication for application 09/886,824, filed July 26, 2007.
2. Claims 23, 25-31, 33, 35-44, 46, 52-55 are pending. Claims 1-22, 24, 32, 34, 45, and 47-51 are cancelled. Claims 23, 28, 33, 35, 36, 41, 44, and 46 are currently amended. Claims 25-27, 29-31, 37-40, 42, and 43 are previously presented. Claims 52-55 are new.
3. After the previous office action, claims 23-51 stood rejected.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 23, 25-31, 33, 52, and 53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter, which was not described for the present invention in the specification in such a way as to reasonably

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Amended independent claim 23 is directed to a method of “measuring a level of similarity between a sample and physical characteristics of an individual” while subject matter described in the specification for the present invention discloses:

(A) “A general object of the present invention is to provide a simpler means of establishing the decision criteria for a pattern recognition system than is generally afforded by traditional methods such as operating characteristic analysis.”;

(B) “More specifically, an object of the present invention is to provide a Normalized Detector Scaling method that utilizes the class-specific probability distributions of a pattern recognition system to make the selection of the operating criteria independent of the particulars of the pattern recognition system. This being accomplished by transforming the pattern recognition system output statistics to a well-defined, one-dimensional scale.”;

(C) “Another object of the present invention is to provide an intuitive interface for decision criteria selection to those operating a pattern recognition system.” (*see* Specification, p. 5).

The techniques disclosed in the specification are applicable to computational methods and systems for matching any type of data. Nowhere in the specification is there disclosed applying (A)-(C) for measuring a level of similarity between a sample and physical characteristics of an

individual. Claims 25-31, 33, 52, and 53 depend from claim 23 with fixing the deficiency of claim 23. Thus claims 23, 25-31, 33, 52, and 53 are considered to be non-statutory under 35 U.S.C. 112, first paragraph.

6. Claims 35-44, 46, 54, and 55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter, which was not described for the present invention in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Amended independent claim 35 is directed toward a functional computer program capable of performing the method of claim 23 and is therefore considered nonstatutory under 35 U.S.C. 112, first paragraph, for the same reason as amended independent claim 23.

Since claims 36-44, 46, 54, and 55 depend from claim 35 with fixing the deficiency of claim 35, claims 35-44, 46, 54, and 55 are considered to be non-statutory under 35 U.S.C. 112, first paragraph.

7. Claims 23, 25-31, 33, 52, and 53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains,

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or with which it is most nearly connected, to make and/or use the invention. Amended independent claim 23 is directed to a method of “measuring a level of similarity between a sample and physical characteristics of an individual” while subject matter described in the specification for the present invention discloses (A)-(C) above as the objects of the present invention without mentioning “measuring a level of similarity between a sample and physical characteristics of an individual”. Clearly “measuring a level of similarity between a sample and physical characteristics of an individual” is not enabled. Claims 25-31, 33, 52, and 53 depend from claim 23 with fixing the deficiency of claim 23. Thus claims 23, 25-31, 33, 52, and 53 are considered to be non-statutory under 35 U.S.C. 112, first paragraph.

8. Claims 35-44, 46, 54, and 55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Amended independent claim 35 is directed toward a functional computer program capable of performing the method of claim 23. As such claim 35 is considered to lack enablement for the same reason as claim 23. Since claims 36-44, 46, 54, and 55 depend from claim 35 with fixing the deficiency of claim 35, claims 35-44, 46, 54, and 55 are considered to be non-statutory under 35 U.S.C. 112, first paragraph.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 23, 25-31, 33, 52, and 53 and 35-44, 46, 54, and 55 are rejected because the claimed invention violates the doctrine of preemption. Amended independent claims 23 and 35 recite the 101 judicial exception of a mathematical algorithm “processing the input data to generate an output representing class-specific probability distributions based on the received input data; computing a transform based on the output; and transforming the probability distributions onto a normalized scale based on the transform”. Further, the objects of the present invention are disclosed as (A)-(C) above. Examiner considers these to be clearly general mathematical techniques not limited in their application to any particular problem domain and thus applicable in every conceivable domain. Since claims 25-31, 33, 52, and 53 depend from claim 23 and claims 36-44, 46, 54, and 55 depend from claim 35 without fixing the deficiency of claims 23 and 35; claims 23, 25-31, 33, 52, and 53 and 35-44, 46, 54, and 55 are considered non-statutory under 35 U.S.C. 101.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 23, 33, 35, 36, 44, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Hamid* (USPN 6,038,334) in view of *Campbell et al.*, "Object Recognition for an Intelligent Room", 2000.

Regarding claim 23. (currently amended) *Hamid* teaches a method of measuring a level of similarity between a sample and physical characteristics of an individual (see col. 7, lines 10-26), comprising:

receiving input data representing physical characteristics of an individual (see col. 7, lines 10-18);

processing the input data to generate an output representing class-specific probability distributions based on the received input data (see col. 10, line 48 to col. 11, line 39, Examiner interprets "g" to be class-specific probability distributions based on the received input data.);

determining an equal error rate associated with the class-specific probability distributions (see col. 12, lines 64-65); and

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establishing at least one decision criterion based upon the equal error rate wherein the at least one decision criterion corresponds to a level of similarity between a sample and the physical characteristics of the individual (*see col. 12, line 67 to col. 13, line 9, Examiner interprets h_α and h_β to be functions defining a decision criterion.*).

Hamid does not teach

computing a transform based on the output; and

transforming the probability distributions onto a normalized scale based on the transform.

Campbell et al. do teach

computing a transform based on the output (*see p. 6, col. 1, Examiner interprets "the vote image", $V(x,y)$, to be a transform based on the output of the Hough kernel, $H_j(x,y)$.*); and

transforming the probability distributions onto a normalized scale based on the transform (*see p. 6, col. 2, "We project each pixel in this image to the unit sphere by dividing by..."*, *Examiner interprets the unit sphere to be a normalized scale.*).

It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Hamid* with *Campbell et al.* to apply an algorithm that can be trained with only a few images of the object (e.g., the iris), that requires only two parameters to be set, and that runs at 0.7 Hz on a normal PC with a normal color camera and has a detection rate of 0.885 with a false alarm rate of 0.03.

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Regarding claim 24. (previously presented) *Hamid* teaches the method according to claim 23, further comprising selecting at least one decision criterion based on at least one value on the normalized scale from which the identity of the individual is authenticated (*see* p. 6. col. 2, “We establish a small acceptance region around each projected color pixel. Each in the LUT is also projected to the unit sphere. If it is not within the acceptance region of any projected pixels of the test image, that LUT location is marked as a color that should be eliminated from consideration as part of the object.”).

Regarding claims 33 and 46. (previously presented) *Hamid* teaches the method of claim 23, wherein the biometric information is derived from a characteristic of speech (*see* col. 5, lines 9-13, *Examiner interprets “other biometric information samples” to include information derived from a characteristic of speech.*).

Regarding claim 35. (currently amended) *Hamid* teaches a pattern recognition system (*see* col. 3, lines 23-27, *Examiner interprets “d) determining if a point in a multidimensional space and having coordinates corresponding substantially to the registration values falls within a multidimensional range determined in dependence upon a predetermined false acceptance rate”, to be a form of pattern recognition.*), comprising:

- a computer readable medium having computer readable program code embodied thereon,
- the computer readable program code, when executed, implementing on the computer a method of

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receiving input data representing biometric information of a known classification (*see col. 7, lines 10-18*),
generating an output representing class-specific probability distributions based on the received input data (*see col. 10, line 48 to col. 11, line 39, Examiner interprets "g" to be class-specific probability distributions based on the received input data.*),
determining an equal error rate associated with the class-specific probability distributions (*see col. 12, lines 64-65*); and
establishing at least one decision criterion based upon the equal error rate wherein the at least one decision criterion corresponds to a level of similarity between a sample and the physical characteristics of the individual (*see col. 12, line 67 to col. 13, line 9, Examiner interprets h_α and h_β to be functions defining a decision criterion.*).

Hamid does not teach computing a transform based on the output, and transforming the probability distributions onto a normalized scale based on the.

Campbell et al. do teach

computing a transform based on the output (*see p. 6, col. 1, Examiner interprets "the vote image", $V(x,y)$, to be a transform based on the output of the Hough kernel, $H_j(x,y)$.*), and
transforming the probability distributions onto a normalized scale based on the transform (*see p. 6, col. 2, "We project each pixel in this image to the unit sphere by dividing by..."*, *Examiner interprets the unit sphere to be a normalized scale.*).

It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Hamid* with *Campbell et al.* to apply an algorithm that can be trained with

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only a few images of the object (e.g., the iris), that requires only two parameters to be set, and that runs at 0.7 Hz on a normal PC with a normal color camera and has a detection rate of 0.885 with a false alarm rate of 0.03.

Regarding claim 36. (previously presented) *Hamid* does not teach the system of claim 35, further comprising decision criteria selection means for selecting at least one decision criterion based on at least one value on the normalized scale from which the identity of the individual is authenticated. However, *Campbell et al.* do teach the system of claim 35, further comprising decision criteria selection means for selecting at least one decision criterion based on at least one value on the normalized scale from which the identity of the individual is authenticated (*see* p. 6. col. 2, “We establish a small acceptance region around each projected color pixel. Each in the LUT is also projected to the unit sphere. If it is not within the acceptance region of any projected pixels of the test image, that LUT location is marked as a color that should be eliminated from consideration as part of the object.”, Examiner interprets “a small acceptance region around each projected color pixel” to include at least one value on the normalized scale from which the identity of the individual is authenticated.). It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Hamid* with *Campbell et al.* to apply an algorithm that can be trained with only a few images of the object (e.g., the iris), that requires only two parameters to be set, and that runs at 0.7 Hz on a normal PC with a normal color camera and has a detection rate of 0.885 with a false alarm rate of 0.03.

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Regarding claim 44. (currently amended) *Hamid* teaches the system of claim 35, wherein the at least one decision criterion defines a single threshold number corresponding to the level of similarity (see col. 7, lines 19-26, *Examiner interprets C_α to be a single threshold number such that signal P is considered to be authentic whenever $h_\alpha(P) \geq C_\alpha$ and spurious whenever $h_\alpha(P) < C_\alpha$*).

Response to Arguments

13. Applicant's arguments are noted. However, in view of the new grounds of rejection, they are considered to be moot.

The §112 Rejections

Applicant argues:

The system and methods disclosed and claimed by Applicant are applicable to computational methods and systems for assessing the similarity between a sample and physical characteristics of an individual of a known classification, such as speech characteristics or other biometric information. The specification provides several examples of such systems. One embodiment describes providing an adaptive speaker identity verification system where the operating criterion may be defined in terms of an equal error rate (EER). Application 4:14-15. As is known, the physical characteristics of an individual's speech may include physiological factors and behavioral factors. With respect to an individual's speech characteristics, the physical characteristics may be attributed to physiological factors associated with the individual's lungs, larynx, vocal cavities, nose aperture, mouth aperture, and sibilants, and the behavioral factors may be attributed to phonetics, such as articulation, formants, phoneme-to-phoneme junctures, and prosodics.

Examiner responds:

Examiner finds no disclosure of the Applicants' claimed *present* invention to processing data based on the "physical characteristics of an individual of a known classification, such as speech characteristics or other biometric information." Examiner finds no disclosure for "Application 4:14-15". The specification merely provides two examples of non-parametric pattern recognition systems in the §BACKGROUND OF THE INVENTION. One example cited is that of a "military defense radar system" (see p. 2). The second example cited is that of "an adaptive speaker identity verification system":

As a second example, consider an adaptive speaker identity verification system where the operating criterion is defined so that the probability of a false-rejection always equals the probability of a false-acceptance. The system performance at this criterion is known as the Equal Error Rate (EER). A person's speech is modeled from multiple instances of speaking the same phrase in order to capture the inherent variability in pronunciation. With only one exemplar of a person's speech, the system may achieve an EER of 4%, while the same system, with two exemplars of the person's speech may achieve an EER of 2% by essentially reducing the variance in the authentic distribution. The decision rule for one exemplar, based on a simple threshold, must be different from the decision rule for two exemplars because the threshold for performing at the EER is different, because the authentic distribution is different. (see p. 4)

However, this makes no specific disclosure of the objects of the *present* invention:

(A) "A general object of the present invention is to provide a simpler means of establishing the decision criteria for a pattern recognition system than is generally afforded by traditional methods such as operating characteristic analysis.";

(B) "More specifically, an object of the present invention is to provide a Normalized Detector Scaling method that utilizes the class-specific probability distributions of a pattern recognition system to make the selection of the operating criteria independent of the particulars of the pattern recognition system. This being accomplished by

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transforming the pattern recognition system output statistics to a well-defined, one-dimensional scale.”;

(C) “Another object of the present invention is to provide an intuitive interface for decision criteria selection to those operating a pattern recognition system.” (*see* Specification, p. 5).

being applied to a method of “measuring a level of similarity between a sample and physical characteristics of an individual”. The remainder of the specification (pp. 6-10) is a mathematical discussion of the pattern recognition technique at hand in terms of abstract: error probabilities, statistical similarities, false-rejection and false-acceptance error regions, etc. Examiner has therefore provided new grounds of §112 rejection.

The §101 Rejections

Examiner withdraws the rejections under 35 U.S.C. §101 based on Applicants’ amendments.

The §103 Rejections

Applicant argues:

In the office action claims 23, 35, 48, 50 and 51 were rejected as being unpatentable over Hamid (U.S. Pat. No. 6,038,334) in view of Campbell "Object recognition for an Intelligent Room." Reconsideration and withdrawal of this rejection is requested.

The Hamid reference generally discloses a system for authenticating biometric information using dimensional probability distribution curves. The Campbell reference relates to developing recognition algorithms for identifying physical objects based upon the Hough kernel. Both references teach methods and systems that entirely different and could not be combined in a manner to render the subject matter of the claims obvious.

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Examiner responds:

Hamid and *Campbell's* technique may have used a different transform method, but it would have been an obvious alternative to Applicants' method, to those of ordinary skill in the art, in attempting to authenticate an individuals identity in real time based on biometric signals which is concomitant under the current amended method "of measuring a level of similarity between a sample and physical characteristics of an individual".

Applicant argues:

The Campbell reference relates to a system for locating a three dimension object from a two dimensional color image generated by a video camera. There is nothing in the Campbell reference suggesting that it can be used to determine whether a sample is similar to a physical characteristic on an individual.

Examiner responds:

Campbell does perform clustering, which requires recognition of an individual's physical feature similarity to a group exemplar (*see* Figure 4 and p. 3, col. 2, "We cluster features with a dendrogram[4], which is a means of clustering vectors by progressively merging the cluster centers that are nearest each other."). This is, at least, suggestive of being useful to determine whether a sample is similar to a physical characteristic on an individual.

Applicant argues:

Similarly, there is nothing in Hamid suggesting the need to transform the output of the probability distributions. Thus, it is submitted that the claims are patentable over these references.

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Examiner responds:

It is possible, in *Hamid*, to need to transform the output of the probability distributions in the process where the “processor then determines a probability distribution for the selected parameters” or where “this is performed prior to the registration process for biometric information samples” or, further, where “the probability distributions are determined or approximated in advance” (*see* col. 8, lines 1-6).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Nathan H. Brown, Jr.
September 28, 2007